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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/563,609	01/06/2006	Andrew Tulloch	1028-0205PUS1	3414

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EXAMINER	
RALEIGH, DONALD L	

ART UNIT	PAPER NUMBER
2879	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary	Application No.	Applicant(s)	
	10/563,609	TULLOCH ET AL.	
	Examiner	Art Unit	
	DONALD L. RALEIGH	2879	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 January 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *06 January 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *01/06/2006,04/06/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Objections

Claim 15 is objected to because of the following informalities: It includes the limitation "digital processing unit" which has no antecedent in the claim. Examiner understands that applicant means "data processing unit" and that element will be examined. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-3, 5-9, 11-13 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abuyama et al (US Patent No. 4,579,443) in view of Then et al (WO 97/05640) and further in view of Kyushima et al (US PG Pub. No. 2003/0102802).

Regarding Claim 1, Abuyama discloses in figures 1 and 5, an imaging machine (title) comprising an imaging unit and a data processing unit (171), the imaging unit comprising at least one light source (22); the data processing unit (171) comprising at least one processor for generating image data (abstract, lines 1-6) based upon signals received from the image collector (16).

Abuyama fails to disclose a plurality of image collectors, each image collector comprising a photosensitive element, a plurality of alternatively stacked layers of a dynode material and an electrical insulator mounted on a substrate, each stacked layer having one or more apertures which aligns with apertures in adjacent layers to form one or more channels extending through the stacked layers and closed at one end by the substrate, an anode provided at the closed end of the channels, and a signal connector connected to the anode and to the data processing unit.

Then teaches, at least in figure 5, a plurality of image collectors(the dynodes (56 + (80) + (96) of Figure 5), each image collector comprising a photosensitive element (80), a plurality of alternatively stacked layers of a dynode material (56)(shown in figure 5) and an electrical insulator (96) mounted on a substrate, each stacked layer having one or more apertures (see figure 5) which aligns with apertures in adjacent layers to form one or more channels extending through the stacked layers and closed at one end by the substrate (Page 2, lines 4-6), an anode (66) provided at the closed end of the channels, and a signal connector connected to the anode (66)(a signal source is shown connected to the anode(66)). Abuyama discloses a data processing unit (abstract, lines 5-6) and Then provides the plurality of image collectors (dynodes in figure 5) for

generating image data based upon signals received from the image collectors (page 11, lines 3-14).

Furthermore, Kyushima teaches using an electron multiplier in an imaging device (¶ [0055], lines 1-4) for use in areas with low light intensity.

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to incorporate the dynode structure, as taught by Then and Kyushima, in the imaging device of Abuyama, for use in areas with low light intensity.

Regarding Claim 2, Abuyama fails to exemplify the imaging machine wherein each image collector channel has a respective anode.

Then teaches in figure 5, wherein each image collector channel (vertical space between dynode elements (56), has a respective anode (66), obviously to transfer signals to the data processor.

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to incorporate the anode in the image collector, as taught by Then, to transfer signals to the data processor, when used in the device of Abuyama.

Regarding Claim 3, Abuyama fails to exemplify the imaging machine wherein each dynode layer is made of an electrically conductive material and at least a region of the surfaces of each dynode layer exposed in each channel is coated in a secondary-electron emissive material.

Then teaches wherein each dynode layer (56) is made of an electrically conductive material (Page 9, lines 9-10) and at least a region of the surfaces of each dynode layer (the region (80)) exposed in each channel is coated in a secondary-

electron emissive material (Page 8, lines 12-19), obviously to increase the amount of electron emission.

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to incorporate the secondary electron emissive material in an electron multiplier, as taught by Then, and use it in the imaging machine of Abuyama, to increase the amount of electron emission.

Regarding Claim 5, Abuyama fails to exemplify the imaging machine wherein the walls of the apertures in each dynode layer are tapered towards the anode.

Then teaches in figure 5, wherein the walls of the apertures in each dynode layer (56) are tapered towards the anode (66)(Figure 5 shows the bottom emissive layer (80) in each dynode is tapered towards the center of element (70) at the bottom which would contain the anode (66)(Page 8, lines 9-11), as an obvious method of funneling emissions towards the anode where they will be converted to signals.

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to incorporate the tapered dynode arrangement, as taught by Then in the electron multiplier, to use in the imaging machine of Abuyama, in order to funnel emissions towards the anode where they will be converted to signals.

Regarding Claim 6, Abuyama discloses in figure 1, an imaging machine (title) further comprising a light-transparent support (2)(although Abuyama does not state that is transparent, it would have to be for the image to be detected), for items to be imaged and with the wall of the chamber facing the open ends of the image collector (16) channels being in light communication with said light-transparent support (2)(Figure 1

shows a light source (22) reflecting off the light transparent support (2) and the image being transferred to the image collector (16) through a series of mirrors (23,24,25 and 26).

Abuyama discloses an image collector (16) but fails to disclose wherein the plurality of image collectors are mounted within an evacuated chamber.

Then teaches in figure 5, a plurality of image collectors (dynodes (56,80,96) are mounted within an evacuated chamber (although Then does not teach that the chambers are evacuated, they would have to be to protect against contamination and unwanted oxidation of the layers.

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to incorporate the vacuum environment, in the image collector of Abuyama, as modified by Then, to protect against contamination and unwanted oxidation of the layers.

Regarding Claim 7, Abuyama discloses in figure 1, the imaging machine (title) wherein the at least one light source (22) is positioned adjacent an edge of the light-transparent support (2), but fails to disclose that the light-transparent support (2) has internal facets to distribute light from the at least one light source(22) to the surface of the transparent support (2) remote from the image collector (16)(Although not disclosed by Abuyama, the reflector (21) normally has facets to distribute the light from the light source (22) to the surface of the stage (2)).

Regarding Claim 8, Abuyama fails to exemplify an imaging machine wherein the substrate and the stacked layers of dynode material and electrical insulator of the image collectors include one or more through holes for permitting the passage of light and wherein the at least one light source is located adjacent the surface of the substrate facing away from the open ends of the image collector channels whereby the one or more through holes are adapted to transport light from the at least one light source to the light-transparent support.

However, Abuyama does disclose a light source (22) which illuminates the stage (2) and is picked up by the imaging device.

Then teaches in figure 5, wherein the substrate (page 2, lines 4-6) and the stacked layers of dynode material (56) and electrical insulator (96) of the image collectors (56,80,96) include one or more through holes (shown) for permitting the passage of light and. Although, Then fails to teach that the at least one light source is located adjacent the surface of the substrate facing away from the open ends of the image collector channels whereby the one or more through holes are adapted to transport light from the at least one light source to the light-transparent support. Abuyama has a light source (22) that illuminates a light transparent support (2) and provides through the mirror system images to the drum (16). It would be possible to use the light source and light transparent support of Abuyama and the image collector of Then. In figure 5, Then shows a plurality of through holes and page 11, lines 3-14 describes the process of converting the light to data.

Furthermore, Kyushima et al teaches using an electron multiplier in an imaging device (¶ [0055], lines 1-4) for use in areas with low light intensity.

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to incorporate the dynode structure, as taught by Then and Kyushima, in the imaging device of Abuyama, for use in areas with low light intensity.

Regarding Claim 9, Abuyama, as modified by Then and Kyushima, fails to exemplify an imaging machine wherein the wall of the evacuated chamber facing the open ends of the image collector channels is said light-transparent support.

Abuyama discloses in figure 1, a light transparent support (2) and an imaging section (16).

Then teaches a plurality of image collector channels in figure 5.

Kyushima teaches a plurality of image collectors (dynodes of an electron multiplier) used in an imaging device (¶ [0055], lines 1-4 , for use in areas with low light intensity. Also, ¶ [0031], teaches in Figure 1, a plurality of dynodes (¶ [0033], lines 2-4) with a light receiving faceplate (3) and that light received would be converted to data signals (¶ [0036], lines 1-19). Although Kyushima does not teach specifically where the image collectors are placed, it is obvious that the open ends would have to be placed over the imaging area in order to capture the light from the image and that the chamber containing them would be evacuated to prevent contamination and deterioration of the electron multiplier.

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to combine the image collector channels, as taught by Then and

Kyushima, in place of the imaging system of Abuyama, to capture light from the light transparent stage of Abuyama, for use in areas with low light intensity.

Regarding Claim 11, Abuyama fails to exemplify an imaging machine wherein the surface area of the plurality of image collectors corresponds to the imaging area of the imaging unit.

Kyushima teaches a plurality of image collectors (dynodes of an electron multiplier) used in an imaging device (¶ [0055], lines 1-4 , for use in areas with low light intensity. Also, ¶ [0031], teaches in Figure 1, a plurality of dynodes (¶ [0033], lines 2-4) with a light receiving faceplate (3) and that light received would be converted to data signals (¶ [0036], lines 1-19). Although Kyushima does not teach specifically where the image collectors are placed, it is obvious that they would have to be placed over the imaging area in order to capture the light from the image.

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, that the surface area of the image collectors, as taught by Kyushima, would correspond to the imaging area in the imaging machine of Abuyama, because this would be necessary to capture the light off of the image .

Regarding Claim 12, Abuyama discloses in figure 1 and the abstract, an imaging machine (title) wherein the data processing unit (abstract, lines 5-6 (processor)) generates image data based only upon signals (abstract, line 3 (coded signals)) received from a selected portion of the plurality of image collectors (16).

Regarding Claim 13, Abuyama discloses in figure 1, an imaging machine further comprising a printing unit (abstract, line 1) in communication with the data processing

unit (abstract, line 5 (processor)) for printing an image based on image data generated by the data processing unit(processor)(abstract, lines 1-6).

Regarding Claim 15, Abuyama discloses a photocopier machine comprising an imaging unit ((16) and the mirrors), a data processing unit (171) and a printing unit (abstract, line 5) in communication with the digital processing unit (171), the imaging unit comprising at least one light source (22), a light-transparent support(2) comprising at least one processor for generating image data (abstract, lines 1-6)based upon signals received from the image collector (16) determining the image to be printed by the printing unit (abstract, line 5).

Abuyama fails to disclose a plurality of image collectors, each image collector comprising a photosensitive element, a plurality of alternatively stacked layers of a dynode material and an electrical insulator mounted on a substrate, each stacked layer having one or more apertures which aligns with apertures in adjacent layers to form one or more channels extending through the stacked layers and closed at one end by the substrate, an anode provided at the closed end of the channels, and a signal connector connected to the anode and to the data processing unit.

Then teaches, at least in figure 5, a plurality of image collectors(the dynodes (56 + (80) + (96) of Figure 5), each image collector comprising a photosensitive element (80), a plurality of alternatively stacked layers of a dynode material (56)(shown in figure 5) and an electrical insulator (96) mounted on a substrate, each stacked layer having one or more apertures (see figure 5) which aligns with apertures in adjacent layers to form one or more channels extending through the stacked layers and closed at one end

by the substrate (Page 2, lines 4-6), an anode (66) provided at the closed end of the channels, and a signal connector connected to the anode (66)(a signal source is shown connected to the anode(66).

Furthermore, Kyushima teaches using an electron multiplier in an imaging device (¶ [0055], lines 1-4) for use in areas with low light intensity.

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to incorporate the image collector system, as taught by Then and Kyushima, in the imaging device of Abuyama, to produce an effective image in areas with low light intensity.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Abuyama (443) in view of Then (640) and Kyushima (802) and further in view of Beetz Jr. et al (US Patent No. 6,384,519).

Regarding Claim 4, Abuyama, as modified by Then and Kyushima, fails to exemplify the imaging machine wherein the electrically-conductive dynode material is non-metallic.

Beetz Jr. teaches the imaging machine wherein the electrically-conductive dynode material is non-metallic (Column 10, lines 49-51. The statement "a metal or other conductive material" suggest that the latter is not a metal, obviously to allow more diversification in the fabrication of the device.

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to incorporate the non-metallic dynode material, as taught by

Beetz, in the imaging machine of Abuyama, as modified by Then and Kyushima, to allow more diversification in the fabrication of the device.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Abuyama (443) in view of Then (640) and Kyushima (802) and further in view of Kittaka et al (US Patent No. 6,366,408).

Regarding Claim 10, Abuyama, as modified by Then and Kyushima, fails to exemplify the imaging machine having an image resolution of at least 5 line pairs per mm.

Kittaka teaches an imaging machine for a copier (Column 1, lines 4-6) having an image resolution of at least 5 line pairs per mm (Column 1, lines 60-62, 12 line-pair/mm) to provide a resolution of 600 dpi.

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to incorporate the optical imaging system, as taught by Kittaka, in the imaging machine of Abuyama, as modified by Then and Kyushima, to achieve a resolution of 600 dpi.

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Abuyama (443) in view of Then (640) and Kyushima (802) and further in view of Birnbaum (US PG Pub. No. 0239961).

Regarding Claim 14, Abuyama, as modified by Then and Kyushima, fails to exemplify an imaging machine wherein the image data generated by the data

processing unit comprises a plurality of image strip data and the printing unit prints an image based upon the plurality of image strip data.

Birnbaum teaches an imaging machine (¶ [0053], lines 7-11 (photocopier)) wherein the image data generated by the data processing unit comprises a plurality of image strip data and the printing unit prints an image based upon the plurality of image strip data (¶ [0039], lines 1-9 describes the claimed process. ¶ [0041], lines 1-4 teaches it connected to a printing unit) to reduce the amount of memory required to render the image data for a tandem printer (¶ [0011], lines 1-4).

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to incorporate the image transfer procedure, as taught by Birnbaum, in the imaging machine of Abuyama, as modified by Then and Kyushima, to reduce the amount of memory required to render the image data for a tandem printer.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DONALD L. RALEIGH whose telephone number is (571)270-3407. The examiner can normally be reached on Monday-Friday 7:30AM to 5:00PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on 571-272-2457. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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